

REMARKS

Applicant appreciates the examination of the present application that is evidenced by the Official Action of September 7, 2004 and the indication that Claims 39-40 are allowed and Claims 26 and 28 would be allowable if rewritten in independent form. In response to the Official Action, Applicant has rewritten Claims 26 and 28 in independent form and added new independent Claim 41, which is similar to the allowable independent Claim 28. Based on these amendments, Claims 26, 28, 39-40 and 41 should be allowable. Thus, the sole outstanding issues are the rejections of Claims 1-25, 27 and 29-36 under 35 USC §§ 102 and 103.

Claims 1-25, 27 and 29-36 are Patentable over the Cited References

Applicant acknowledges that U.S. Patent Publication No. 2002/0039833 to Bensahe et al. discloses a plurality of quantum dots **22** in a semiconductor substrate **20**. However, neither the quantum dots **22** nor the semiconductor substrate **20** is disclosed as a wide bandgap semiconductor material, which as defined in the present application, requires a bandgap of greater than about 2 eV. (See, e.g., Application, p. 5). In particular, the substrate **20** in Bensahe et al. is disclosed as a silicon (Si) substrate having a bandgap of 1.1 eV and the quantum dots **22** are disclosed as germanium (Ge) dots having a bandgap less than 1.1 eV (the bandgap for Ge is 0.7 eV). (See, e.g., Bensahe et al., p. 2, paragraph 25). Moreover, neither the substrate **20** nor the quantum dots **22** are disclosed as regions containing intentional dopant impurities. Thus, it cannot reasonably be maintained that Bensahe et al. discloses or suggests the subject matter of any of the rejected claims of the present application, which recite doped wide bandgap semiconductor regions and layers.

These same arguments also apply to U.S. Patent Publication No. 2002/0059971 to Chua et al. In particular, neither the barrier and well layers (layers 5 and 6) nor the quantum dots in Chua et al. are disclosed or suggested as being doped layers. Moreover, Chua et al. actually discloses quantum dots

In re: Adam W. Saxler
Serial No.: 10/619,228
Filed: July 14, 2003
Page 10

having a lower bandgap than a surrounding InGaN barrier layer (layer 5) and no clear disclosure or suggestion regarding the bandgap of the quantum dots relative to the InGaN well layer (layer 6). (See, Chau et al., Claim 1, where $w > 0.20$ for the quantum dots and $x \leq 0.1$ for the barrier layer, which means the quantum dots have a smaller bandgap relative to the barrier layer). Thus, it cannot be reasonably maintained that Chua et al. discloses or suggests the subject matter of the present claims even when combined with Bensahel et al.

CONCLUSION

Applicant has shown that none of the cited references disclose or suggest an array of discontinuous wide bandgap semiconductor regions that are doped. The cited references also do not disclose or suggest an array of discontinuous wide bandgap semiconductor regions that have a higher bandgap relative to a surrounding wide bandgap semiconductor layer. Because of these deficiencies in the cited prior art, Applicant respectfully submits that all pending claims are patentable. The Examiner is encouraged to contact the undersigned in the event any outstanding issues remain which may prevent issuance of the present application.

Respectfully submitted,



Grant J. Scott
Registration No. 36,925

USPTO Customer No. 20792
Myers Bigel Sibley & Sajovec
Post Office Box 37428
Raleigh, North Carolina 27627
Telephone: 919/854-1400
Facsimile: 919/854-1401